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Engineer Research and Development Center

LIDAR Fact Sheet
High Resolution Terrain Data for Improved Battlefield Visualization

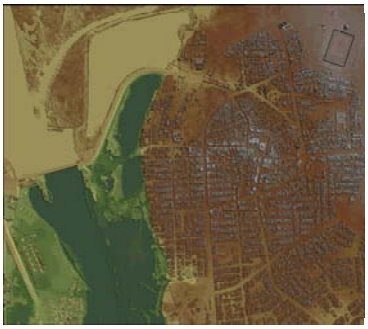
Background: Light Detection and Ranging (LIDAR) sensors provide high resolution 3-dimensional (3D) geospatial data. Using capabilities developed and refined under the Rapid Terrain Visualization Advanced Concept Technology Demonstration (RTV ACTD), TEC continues to perform LIDAR data collections, exploit LIDAR data for operational support, and research LIDAR technologies. LIDAR data can be used as a stand-alone product, or as an accurate foundation for rectifying and draping high-resolution imagery. LIDAR provides a way to see urban areas in rich 3D views that gives tactical forces unprecedented awareness in urban environments. LIDAR data is both high resolution and high accuracy, giving U.S. Forces data for improved battlefield visualization, mission planning, and force protection. TEC is using LIDAR for Urban Tactical Planner and other special urban products. LIDAR also supports automated extraction of urban features like buildings and trees, a critical technological improvement for constructing simulation databases rapidly.

LIDAR Data Products:

Standard TEC LIDAR data sets are 1-meter resolution, although higher resolutions are possible and have been collected for special purposes. The standard projection is Universal Transverse Mercator (UTM), and the standard format is GeoTIFF. There are 5 files for every LIDAR data set:

1. First Return Digital Elevation Model (DEM) – 32-bit floating point gridded matrix - designated by a1
2. Last Return DEM – 32-bit floating point gridded matrix - designated by a2
3. Intensity Image (int) – 8-bit
4. Color Coded Shaded Relief Image (clr) – 24-bit
5. Merged Intensity-Color Coded Shaded Relief Image (mrg) – 24-bit

Optional LIDAR products include X, Y, Z point cloud data in ASCII format, gridded bare earth DEM's in GeoTIFF format, extracted features (buildings, tree points, forest polygons) in ESRI Shape file format, and TerraExplorer Fly-Thru's.



DEM displayed as Color Shaded Relief

Intensity Image

Merged Intensity-Color Shaded Relief Image

3D View of DEM

Current Operations: A LIDAR mission began support to Operation Iraqi Freedom in November 2005. Other recent LIDAR collections include Fort AP Hill, VA and Fort Polk, LA. Distribution of data from the archive of LIDAR holdings is continuous and ongoing. New data collections can be accomplished with reimbursable funds from the requesting agency.

Future Developments: LIDAR technologies for tactical use are under development in the Urban Recon ACTD. These include airborne LIDAR sensors on manned and unmanned platforms, and ground-based LIDAR sensors to collect detailed urban 3D data at street level.

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